Please rewrite claims 1, 25, 29, and 39 as set forth below in clean form. Additionally, in accordance with 37 CFR 1.121(c)(1)(ii), amended claims 1, 25, 29 and 39 are set forth in a marked-up version in the pages attached to this Amendment.

1. (Twice amended) A method of replicating content data stored on a central content server to at least one local content server, comprising the steps of:

determining unused bandwidth on a common link of an access data network carrying subscriber traffic and over which the central content server located in a hub site and the at least one local content server located in a central office communicate; and

transmitting content data stored on the central content server to the at least one local content server substantially on the determined unused bandwidth.

25. (Once amended) An access data network, for providing access services to at least two different network domains, comprising:

a communication access node coupled to a first network domain;

a central content server located at a hub site for storing content data coupled to the communication access node;

a plurality of digital subscriber line transceivers coupled to network ends of subscriber lines, for data communication with transceivers coupled to customer premises end of respective subscriber lines;

an access switch coupled for data communication with the digital subscriber line transceivers, for receiving data from customer premises equipment via respective ones of the digital subscriber line transceivers and for supplying data intended for

transmission to predetermined customer premises equipment to the respective ones of the digital subscriber line transceivers;

a high-speed data link between the access switch and the communication access node;

a layer-2 protocol logical communication circuit provisioned through the access switch and the high-speed data link for each subscriber line, wherein each logical communication circuit is provisioned to extend from a respective customer premises to the communication access node;

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a second network domain coupled locally to the access switch;

a local content server located in a central office for storing content data coupled to the second network domain; and

a logical communication circuit for content distribution between the central content server and the local content server provisioned through the access switch and the high-speed data link, the provisioning of the logical communication circuit for content distribution enabling communication of content data between the communication access node and the access switch over bandwidth unused by traffic on the layer-2 protocol logical communication circuits.

C3

29. (Once amended) An access data network as in claim 28, wherein the first transmission type comprises a type of the local area network protocol adapted for internetwork service provider applications.

C4

39. (Once amended) An access data network for providing a combination of wide area internetwork access service and vertical communication services, comprising:

a hub data switch connected to a coupled to the wide area internetwork;

a central content server located at a hub site coupled for data communication via the hub data switch;

a plurality of digital subscriber line transceivers coupled to network ends of subscriber lines, for data communication with transceivers coupled to customer premises ends of respective subscriber lines;

a multiplexer coupled to the digital subscriber line transceivers, for receiving data from customer premises equipment via respective ones of the digital subscriber line transceivers and for supplying data intended for transmission to predetermined customer premises equipment to the respective ones of the digital subscriber line transceivers;

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an access switch coupled to the multiplexer;

a high-speed data link between the access switch and the hub data switch;

a vertical services network coupled locally to the access switch;

a local content server located at a central office coupled for data communications via the vertical service network; and

a logical circuit between the central content server and the local content server for transport of content data between the servers, wherein provisioning associated with the logical circuit in the hub data switch or in the access switch allocates otherwise available bandwidth to the logical circuit within the high-speed data link between the access switch and the hub data switch when not otherwise used by the customer traffic.

Please add new claims 46-57 that appear below.

46. (New) A method of replicating content data stored on a central content server to at least one local content server, comprising the steps of:

determining unused bandwidth on a common link of an access data network carrying subscriber traffic and over which central content server and the at least one local content server communicate;

transmitting content data stored on the central content server to the at least one local content server substantially on the determined unused bandwidth;

storing the content data transmitted to the at least one local content server on the at least one local content server; and

transmitting the content data stored on the at least one local content server to at least one end user terminal proximate to the at least one local content server, wherein the step of transmitting the content data stored on the at least one second server to the at least one end user terminal comprises the steps of:

transmitting the content data stored on the at least one second server to a data switch proximate to the at least one second server,

integrating the content data transmitted from the at least one second server with the other data destined to the at least one end user terminal received at the data switch via the common link, and

distributing the integrated data from the data switch to a link to equipment of the at least one end user terminal via a multiplexer.

47. (New) The method of Claim 46, wherein the multiplexer is a Digital Subscriber Line Access Multiplexer (DSLAM).

48. (New) A method of replicating content data stored on a central content server to at least one local content server, comprising the steps of:

determining unused bandwidth on a common link of an access data network carrying subscriber traffic and over which central content server and the at least one local content server communicate;

transmitting content data stored on the central content server to the at least one local content server substantially on the determined unused bandwidth;

storing the content data transmitted to the at least one local content server on the at least one local content server;

transmitting the content data stored on the at least one local content server to at least one end user terminal proximate to the at least one local content server, wherein the step of transmitting the content data stored on the at least one local content server to the at least one end user terminal proximate to the at least one local content server comprises the steps of:

C5 Cont.

provisioning a logical communication circuit extending from the at least one end user terminal through the network to a communication access node coupled to a first network domain, at least a portion of the logical communication circuit extending through the common link, wherein the provisioning comprises defining the logical communication circuit in terms of a layer-2 protocol defining switched connectivity through the network;

at the data switch, examining communicated information in transmissions from the customer premises, for a protocol encapsulated within said layer-2 protocol, to distinguish transmission types;

forwarding each detected transmission of a first transmission type from the data switch to the communication access node over the logical communication circuit defined in terms of the layer-2 protocol; and

forwarding each detected transmission of a second type, different from the first transmission type, to a second network domain logically separate from the first network domain, wherein the at least one local content server is coupled to the second network domain to receive at least one transmission of a second type for control of the step of transmitting the content data stored on the at least one local content server to at least one end user terminal proximate to the at least one local content server, and

receiving first downstream transmissions intended for the at least one end user terminal at the data switch, over the logical communication circuit from the first network domain;

receiving second downstream transmissions intended for the at least one end user terminal from the second network domain at the data switch, content data from the at least one local content server; and

inserting the second downstream transmissions into the logical communication circuit, to combine the first and second downstream transmissions for communication over the logical communication circuit from the data switch to the at least one end user terminal.

49. (New) A method as in claim 48, wherein the logical communication circuit comprises an asynchronous transfer mode (ATM) permanent virtual circuit (PVC).

Cont.

50. (New) An access data network, for providing access services to at least two different network domains, comprising:

a communication access node coupled to a first network domain;

a central content server for storing content data coupled to the communication access node;

a plurality of digital subscriber line transceivers coupled to network ends of subscriber lines, for data communication with transceivers coupled to customer premises end of respective subscriber lines;

an access switch coupled for data communication with the digital subscriber line transceivers, for receiving data from customer premises equipment via respective ones of the digital subscriber line transceivers and for supplying data intended for transmission to predetermined customer premises equipment to the respective ones of the digital subscriber line transceivers;

a high-speed data link between the access switch and the communication access node;

a layer-2 protocol logical communication circuit provisioned through the access switch and the high-speed data link for each subscriber line, wherein each logical communication circuit is provisioned to extend from a respective customer premises to the communication access node;

a second network domain coupled locally to the access switch;

a local content server for storing content data coupled to the second network domain;

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a logical communication circuit for content distribution between the central content server and the local content server provisioned through the access switch and the high-speed data link, the provisioning of the logical communication circuit for content distribution enabling communication of content data between the communication access node and the access switch over bandwidth unused by traffic on the layer-2 protocol logical communication circuits;

a controller associated with the access switch, for examining communicated in transmissions from respective customer premises, for a protocol encapsulated within said layer-2 protocol, to distinguish transmission types, and in response to cause the switch to:

forward each detected transmission of a first transmission type to the communication access node over a respective one of the logical communication circuits defined in terms of the layer-2 protocol;

forward each detected transmission of a second type, different from the first transmission type, to the second network domain;

receive first downstream transmissions intended for one customer premises from the communication access node, over a respective logical communication circuit;

receive second downstream transmissions intended for the one customer premises from the second network domain, wherein content stored on the local content server is transmitted to the one customer premises over at least some of the second downstream transmissions; and

insert the second downstream transmissions into the respective logical communication circuit, to combine the first and second downstream transmissions for transport via one of the digital subscriber line transceivers which serves the one customer premises.

C5 Cont.

51. (New) An access data network as in claim 50, wherein each of the logical communication circuits comprises an Asynchronous Transfer Mode (ATM) permanent virtual circuit (PVC).

52. (New) An access data network as in claim 50, wherein said controller comprises means for distinguishing between types of local area network protocol transmissions encapsulated within said layer-2 protocol.

53. (New) An access data network, for providing access services to at least two different network domains, comprising:

a communication access node coupled to a first network domain;

a central content server for storing content data coupled to the communication access node;

a plurality of digital subscriber line transceivers coupled to network ends of subscriber lines, for data communication with transceivers coupled to customer premises end of respective subscriber lines;

an access switch coupled for data communication with the digital subscriber line transceivers, for receiving data from customer premises equipment via respective ones of the digital subscriber line transceivers and for supplying data intended for transmission to predetermined customer premises equipment to the respective ones of the digital subscriber line transceivers;

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a high-speed data link between the access switch and the communication access node;

a layer-2 protocol logical communication circuit provisioned through the access switch and the high-speed data link for each subscriber line, wherein each logical communication circuit is provisioned to extend from a respective customer premises to the communication access node;

a second network domain coupled locally to the access switch;

a local content server for storing content data coupled to the second network domain; and

a logical communication circuit for content distribution between the central content server and the local content server provisioned through the access switch and the high-speed data link, the provisioning of the logical communication circuit for content distribution enabling communication of content data between the communication access node and the access switch over bandwidth unused by traffic on the layer-2 protocol logical communication circuits, wherein the first transmission type comprises a type of the local area network protocol adapted for internetwork service provider applications.

54. (New) An access network as in claim 53, wherein:

the local area network protocol comprises an Ethernet protocol, and

the first transmission type comprises point-to-point protocol over Ethernet.

55. (New) An access data network, for providing access services to at least two different network domains, comprising:

a communication access node coupled to a first network domain;

a central content server for storing content data coupled to the communication access node;

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a plurality of digital subscriber line transceivers coupled to network ends of subscriber lines, for data communication with transceivers coupled to customer premises end of respective subscriber lines;

an access switch coupled for data communication with the digital subscriber line transceivers, for receiving data from customer premises equipment via respective ones of the digital subscriber line transceivers and for supplying data intended for transmission to predetermined customer premises equipment to the respective ones of the digital subscriber line transceivers;

a high-speed data link between the access switch and the communication access node;

a layer-2 protocol logical communication circuit provisioned through the access switch and the high-speed data link for each subscriber line, wherein each logical communication circuit is provisioned to extend from a respective customer premises to the communication access node;

a second network domain coupled locally to the access switch;

a local content server for storing content data coupled to the second network domain; and

a logical communication circuit for content distribution between the central content server and the local content server provisioned through the access switch and the high-speed data link, the provisioning of the logical communication circuit for content distribution enabling communication of content data between the communication access node and the access switch over bandwidth unused by traffic on the layer-2 protocol logical communication circuits, wherein each provisioning of the logical communication circuit for content distribution assigns unspecified bit rate service thereto with an associated minimum service guarantee.

56. (New) An access data network, for providing a combination of wide area internetwork access service and vertical communication services, comprising:

a hub data switch connected to a coupling to the wide area internetwork;

a central content server coupled for data communication via the hub data switch;

a plurality of digital subscriber line transceivers coupled to network ends of subscriber lines, for data communication with transceivers coupled to customer premises ends of respective subscriber lines;

a multiplexer coupled to the digital subscriber line transceivers, for receiving data from customer premises equipment via respective ones of the digital subscriber line transceivers and for supplying data intended for transmission to predetermined customer premises equipment to the respective ones of the digital subscriber line transceivers;

an access switch coupled to the multiplexer;

a high-speed data link between the access switch and the hub data switch;

a vertical services network coupled locally to the access switch;

a local content server coupled for data communications via the vertical service network; and

a logical circuit between the central content server and the local content server for transport of content data between the servers, wherein provisioning associated with the logical circuit in the hub data switch or in the access switch allocates otherwise available bandwidth to the logical circuit within the high-speed data link between the access switch and the hub data switch when not otherwise used by customer traffic, wherein the logical circuit comprises

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at least one Asynchronous Transfer Mode (ATM) permanent virtual circuit (PVC), wherein the at least one ATM PVC is provisioned to provide a guaranteed minimum bandwidth in combination with unspecified bit rate service for the logical circuit within the high-speed data link.

57. (New) An access data network, for providing a combination of wide area internetwork access service and vertical communication services, comprising:

a hub data switch connected to a coupling to the wide area internetwork;

a central content server coupled for data communication via the hub data switch;

a plurality of digital subscriber line transceivers coupled to network ends of subscriber lines, for data communication with transceivers coupled to customer premises ends of respective subscriber lines;

a multiplexer coupled to the digital subscriber line transceivers, for receiving data from customer premises equipment via respective ones of the digital subscriber

line transceivers and for supplying data intended for transmission to predetermined customer premises equipment to the respective ones of the digital subscriber line transceivers;

an access switch coupled to the multiplexer;

a high-speed data link between the access switch and the hub data switch;

a vertical services network coupled locally to the access switch;

a local content server coupled for data communications via the vertical service network;

a logical circuit between the central content server and the local content server for transport of content data between the servers, wherein provisioning associated with the logical circuit in the hub data switch or in the access switch allocates otherwise available bandwidth to the logical circuit within the high-speed data link between the access switch and the hub data switch when not otherwise used by customer traffic;

a respective subscriber logical communication circuit provisioned in terms of a layer-2 routing protocol through the access switch and the high-speed data link, for each subscriber line to the subscriber to the hub data switch;

means associated with the access switch for examining communicated information in transmissions on the subscriber logical communication from each respective customer premises, for protocol layers higher than the layer-2 routing protocol, to distinguish transmission types;

wherein:

the access switch routes each detected transmission of a first transmission type, received from a customer premises via the respective subscriber logical